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People Judge a Book through its Cover and Humans by their Eyes

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Abstract: Individuals are constantly trying to understand others, forming impressions about their personality traits, intentions and motivations. Physical appearance is the most immediate attribute in social interaction and, when we perceive facial features, there is a predisposition to focus attention on the eyes. The size of this facial feature may influence either the perception of positive attributes like warmth and competence or the persuasive outcomes. Previous research suggests that the influence of this facial trait on social perception increases with age. Hence, we aimed to observe the effect of eye size in the way individuals aged over 50 years perceive warmth/competence and on persuasion, as well as possible gender differences. We assessed 120 participants (60 men and 60 women), 50 to 99 years old. The task design was 3 (eye size: small vs. control vs. large) X 2 (gender of participants: male vs. female) with two dependent variables: perception of warmth/competence and degree of persuasion. Warmth and competence were measured through Fiske's model and persuasion through the degree of agreement with a statement. Results show that individuals with large eyes are perceived as warmer but no effect was observed for persuasion. No gender differences were identified. The discussion of these results is based on the premise that the eyes are a central trait when forming impressions and that changing their size may affect the perception of positive attributes and persuasive outcomes.

Keywords: Social Perception; Impression Formation; Warmth and Competence; Persuasion; Physical Attractiveness; Eye Size.

1. INTRODUCTION

Humans are social creatures by nature and they are constantly trying to make sense of the world, with the purpose of upholding more functioning interactions within dynamic environments. This effort is based on social perception, which includes the cognitive processes through which we observe, recognize, organize and understand the stimuli we are exposed to [1]. Within the processes people use to try to understand others, promoting the effectiveness of ongoing interrelationships, we include the way individuals form impressions or make judgments about a person, namely his or her personality traits, intentions or motivations [2, 3].

Impression formation comprises the integration of different traits into a coherent impression of the target, so that this information may be integrated in a meaningful category for the perceiver [3]. This inference process requires little information and we often do it without tangible evidence of the inferred traits [2]. We can get this information directly (through interaction and observation of verbal and nonverbal cues) or indirectly (through others) [4].

Nevertheless, through the inference of personality traits, intentions and motivations, the target may receive either positive or negative evaluation and individuals' behavior is consistent with this evaluation.

A number of different theories have emerged to explain the impression formation process, classified according to their assumptions upon human information processing. Asch's configurational approach [3] describes impression formation as a theory-driven process, whereas models such as Anderson's linear approach [5] consider it a data-driven process. Asch's approach takes the point of view that physical and behavioral characteristics determine first impressions.

Since forming impressions is a process that involves an intrinsic evaluation, certain traits may be more central than others and appear to have more impact in final impression, defining the association among peripheral traits and supporting a consistent impression. These central traits should lead to the evocation of other traits, constructing an interpretive map to one's behavior and personality. As a result, the change in a central trait (e.g. facial features like eyes) may result in a completely different impression [3, 6].

Despite the number of factors we can consider in social perception, physical beauty and attractiveness seem to play a major role [7]. Physical appearance, besides sexual identity, is the most immediate attribute in social interaction; as a result, when forming an impression, we are likely to relate components of physical appearance to personality traits. Dion,

Berscheid and Walster [8] pointed out that we make use of several heuristics that confirm our tendency to establish an association between both attributes. For example, based on the belief that what is beautiful is good, we tend to identify more positive attributes when individuals are perceived as more beautiful and attractive [8, 9, 10]. Furthermore, associations between the degree of physical attractiveness [11] and the perception of positive characteristics, such as social desirability, professional and familiar success [8], honesty [12] and social adaptability [13] are reported.

Previous findings show that physical attractiveness influences persuasive outcomes [14, 15, 16, 17]. Chaiken's heuristic-systematic model [17] hypothesizes that physical attraction is a heuristic that reduces the cognitive effort used in a decision-making process and influences the audience, through attributes that allow a more effective communication. In fact, Olson and Marshuetz [18] explain that physical attractiveness is predominantly defined by facial attractiveness and assessed in a glance, thus influencing one's persuasiveness, even without a deliberate intention [19].

The effects of physical attractiveness on persuasion have been studied in several areas, mainly in advertising industry, which makes an effort to use attractive models in the promotion of beauty-enhancement products and others [19, 20, 21]. Other findings suggest that facially attractive individuals are more likely to be employed after a job interview [22] or to have a better public image and credibility upon an audience [23].

As far as attractiveness is concerned, some characteristics have emerged as more determinant, mostly because we tend to consider hyper female faces with smaller jaws, fuller lips and larger eyes more attractive [24]. In the context of visual (facial) perception, research [25, 26] shows that when observing static facial displays individuals have a predisposition to focus attention on the eyes. Geldart, Maurer and Carney [27] also verified that eye size can influence facial aesthetic judgments in adults and the visual fixations of five-month-olds.

The previous results highlight the important role played by eye size in the perception of beauty, which may be due to the preference for expressive faces and larger facial features (babyish faces) [27]. More recently, Gonçalves and colleagues [28] confirmed that eye size influences attractiveness in female individuals. When faced with a female Caucasian picture with small, medium or large eyes, individuals perceive the one with large eyes as more attractive.

Recent studies [29, 30] support the idea that social perception is based on two major dimensions: warmth and competence. Warmth is defined as how kind, friendly and affectionate a person is perceived, while competence is related to ability and efficiency. So, when we meet someone, we rapidly judge him or her for both warmth and competence.

Accordingly, the stereotype content model [29] hypothesizes that all individuals and groups are perceived along these dimensions, which are associated with the development of categorical representations for people we come across for the first time, in our attempts to understand the others. Furthermore, there is predisposition to evaluate warmth more rapidly than competence.

Perceiving individuals on the basis of social categories influences both the way information is encoded and its interpretation, such that individuals dynamically search for information that validates their understanding of others [31], due to halo effect [29, 30]. This means that if a person is perceived as warm, probably she will also be rated as competent.

Furthermore, when rating warmth and competence, people are more likely to privilege ingroup members (one's own group), namely based on gender differences. Consequently, ingroup members are commonly regarded as warm and competent, whereas outgroup members (a group to which one does not belong to) are rated as low either in warmth or competence or both [29, 30].

Finally, when relating warmth and competence dimensions to eye size, recent research [28] support the idea that female individuals with larger eyes are judged as being warmer than those with medium and small eyes. These findings also show that older individuals tend to be more sensitive to this trait than younger individuals. Overall, these results may be based on the fact that social categorization has its roots in learning experiences and in the innate need for stability, which increase with age. However, the literature on the subject uses as participants young adults (mostly college students) and/or adults and there were no studies that use participants with older ages. Given that the impressions we form about others are directly associated with social interaction, it seems important to conduct further studies with samples that include participants with ages above 50 years, so as to analyze possible variances among different age groups.

According to these accounts, and in order to see whether age influences the way people form impressions based on the eyes, thus confirming previous research, the aim of the present study was to observe the effect of eye size in the way individuals aged over 50 years perceive warmth and competence and on persuasion. Additionally, we intended to analyze possible gender differences, due to the potential influence of ingroup and outgroup in one's social perception.

Therefore, we hypothesize that: (1) eye size influences perceived warmth and competence; (2) eye size influences the degree of agreement with a statement; (3) the degree of warmth and competence perceived varies with gender; (4) the agreement with a statement varies with gender.

2. METHOD

2.1 Design and Participants

This study has an experimental design 3 (eye size: small vs. medium vs. large) X 2 (gender of participants: male vs. female) with two dependent variables, perception of warmth/competence and degree of persuasion.

We used a convenience sample of 120 individuals ranged from 50 to 99 years old (M = 69.76, SD = 12.82), 60 men (M

= 70.62, *SD* = 1.63) and 60 women (*M* = 68.90, *SD* = 1.68). With respect to age, no statistically significant differences were found among conditions.

20 participants were randomly assigned per condition, rating warmth and competence of a Caucasian female picture, as well as the degree of agreement with a statement.

34.5% of the participants did not hold a scholar qualification, 16.7% completed 2 years of schooling and 13.3% completed 4 years of schooling. 6.7% of the participants held a bachelor's degree.

2.2 Instruments

We selected a picture with an average-looking female face and manipulated the eye size (figure 1).

Figure 1. Eye size manipulation.

A itions concerning the eye size. From the left, we can see small, medium (control) and large eye size. Participants were assigned to a different condition according to their gender. Hence, 20 participants of each group were exposed to one of the three pictures, followed by a questionnaire.

The perception of warmth and competence was measured with the instrument used to assess the stereotype content model [29], which includes 14 items, 7 to evaluate competence (e.g. competent) and 7 to evaluate warmth (e.g. friendly). Considering the participants' age, the items were answered according to a 5 point scale, from 1 (*Nothing*) to 5 (*A lot*), whereas the original instrument has a 7 point scale.

Both the overall scale (α = 0.824) and the warmth dimension presented an excellent reliability (α = 0.894), except for the competence dimension (α = 0.457).

To assess the degree of identification with the female in the picture and thus possible ingroup or outgroup differences, the questionnaire included a question about the extent through which participants perceived themselves as physically similar to the female in the picture. The item was answered according to a 5 point scale, from 1 (*Nothing*) to 5 (*A lot*). This question was followed by different physical characteristics in which participants might be similar (face shape, ears, hair, eyes, lips, eyebrows, nose and skin color).

With the purpose of measuring the degree of persuasion, participants rated their agreement with the statement "*The construction of dams, despite the costs, is good for economy*", by imagining it was pronounced by the female in the picture. We used a 5 point scale from 1 (*Nothing*) to 5 (*A lot*). This statement was selected through a preliminary test with 10 statements regarding social and political issues. We selected the statement with higher inter-observer consistency and which was rated nearest to the scale median.

Additionally, the questionnaire included biographic questions (age, scholar qualifications and formation area) and a manipulation check item, through which participants were asked to identify the aim of the study.

2.3 Procedure

Participants were approached in several settings, namely public spaces and elderly care institutions, and a signed informed consent was obtained before data collection. Individuals were informed they would participate in a study about human behavior and anonymity and confidentiality of the disclosed data was assured. Participants were given a picture and interviewed by the researcher. Afterwards, participants were debriefed on the specific goal of the study and additional information was given when requested.

3. RESULTS

3.1. Manipulation Check

Before conducting any further analysis on the data, we analyzed the results from the manipulation check, which indicate that none of the participants identified the aim of the study. Therefore, no participants were excluded from the sample.

3.2. Perception of Warmth and Competence

Table 1 shows the descriptive analysis of the variables concerning the overall perception of warmth and competence.

Table 1. Mean scores and standard deviation for the overall perception of warmth/competence by condition.

Gender	Eye size						Total	
	Small		Medium		Large			
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Male	3.07	0.36	3.54	0.26	3.73	0.37	3.44	0.43
Female	3.16	0.35	3.56	0.34	3.68	0.43	3.46	0.43
Total	3.11	0.35	3.55	0.29	3.70	0.39	3.45	0.43

Based on this study's design, we analyzed the perception of warmth and competence using a one-way analysis of variance (ANOVA). We observed an effect of eye size on the overall perception of warmth and competence [$F(2, 114) = 76.550$, $p = 0.013$]. Neither a gender [$F(1, 114) = 0.253$, $p = 0.665$] nor an interaction effect [$F(2, 114) = 0.388$, $p = 0.680$] were identified.

Multiple comparisons were conducted by use of a Tukey *post-hoc* test, allowing us to observe significant differences between the small eye size and the control size ($p < 0.001$) and between the small eye size and the large size ($p < 0.001$). However, no statistically significant differences were found between the medium and large eye sizes ($p > 0.050$). Warmth and competence are perceived as higher in the large eye size condition ($M = 3.70$, $SD = 0.39$), than in the medium eye size ($M = 3.55$, $SD = 0.29$) and in the small eye size conditions ($M = 3.11$, $SD = 0.35$).

As for different dimensions, ANOVA shows an effect of eye size in the way the participants perceive warmth [$F(2, 114) = 48.090$, $p < 0.001$], but neither a gender [$F(1, 114) = 0.001$, $p = 0.978$] nor an interaction effect [$F(2, 114) = 0.804$, $p = 0.450$] were identified.

Tukey *post-hoc* test shows significant differences between the small eye size and the control eye size ($p < 0.001$) and between the small eye size and the large eye size ($p < 0.001$). No statistically significant differences were found between the medium and large eye size ($p > 0.050$). Figure 2 summarizes mean scores for the perception of warmth along with the eye size. Warmth in the large eye size condition ($M = 3.84$, $SD = 0.50$) is perceived as higher than in the medium size ($M = 3.62$, $SD = 0.41$) and in the small size conditions ($M = 2.84$, $SD = 0.51$).

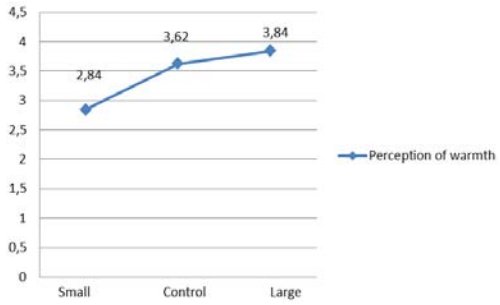

Figure 2. Mean scores for warmth perception according to eye size.

In contrast, no effect of eye size on competence [$F(2, 114) = 2.436$, $p = 0.092$] was found nor a gender effect [$F(1, 114) = 0.346$, $p = 0.557$]. Additionally, no interaction was observed [$F(2, 114) = 0.009$, $p = 0.991$], but it should be noted that mean scores are higher in conditions representing large eyes, both for male ($M = 3.55$, $SD = 0.31$) and females ($M = 3.58$, $SD = 0.46$). The lowest mean scores were found in small eye size condition, both for males ($M = 3.37$, $SD = 0.40$) and females ($M = 3.41$, $SD = 0.30$).

Finally, there is a moderate positive correlation between warmth and competence dimensions ($r = 0.440$, $p < 0.001$), implying that higher warmth ratings are associated with higher competence ratings.

3.3. Identification

As for the identification with the female in the picture, we observed that different eye size conditions do not interfere significantly with the responses ($p > 0.050$). Though, there are statistically significant differences for gender [$F(1, 114) = 12.981$, $p < 0.001$]. Females showed a higher degree of identification ($M = 1.82$, $SD = 0.85$) than males ($M = 1.33$, $SD = 0.60$), which might have been due to the use of a female face, causing women to identify more than men.

No correlation was found between the degree of identification and warmth ($r = 0.086$, $p = 0.351$) or competence ($r = 0.083$, $p = 0.367$). Similarly, we did not observe a correlation between identification and persuasion ($r = -0.018$, $p = 0.844$).

Concerning the physical similarities with the female in the picture, the eyes were the most mentioned trait (22.5%), followed by hair (14.2%) and skin color (13.3%).

3.4. Degree of Persuasion

Figure 3 shows the different mean scores found for the degree of persuasion according to eye size and gender, concerning participants' agreement with the statement "*The construction of dams, despite the costs, is good for economy*".

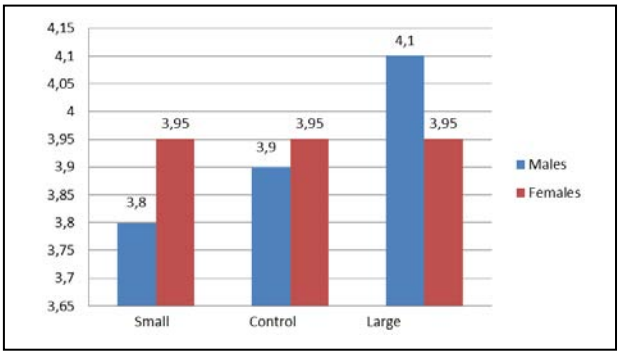

Figure 3. Mean scores for the degree of persuasion according to eye size and gender.

ANOVA shows no statistically significant differences for eye size, gender or interaction ($p > 0.050$). Nevertheless, we must note that the large eye size condition shows an overall higher mean ($M = 4.03$, $SD = 0.66$) than the medium ($M = 3.93$, $SD = 0.47$) and small size ones ($M = 3.88$, $SD = 0.61$). Males have the same tendency, whereas females are not influenced by eye size, which may be explained by the fact that, as it is a female picture, it elicits more attention on the opposite gender.

4. DISCUSSION

The present study aimed to observe the effect of eye size in the way individuals aged over 50 years perceive warmth and competence and on persuasion, also analyzing possible gender differences.

4.1. Effect of Eye Size on the Perception of Warmth and Competence

Based on the analysis of variance for warmth and competence, we observed an effect of eye size on the overall perception of

these attributes, which is consistent with previous knowledge, showing that a trait may be central in impression formation [3, 6]. Within the context of the present investigation, changing eye size results in a different perception; hence, we can infer its primacy on the perception of warmth and competence attributes. These findings support the idea that larger eyes are more attractive [24] and may lead to more positive evaluations. So, it seems like individuals with larger eyes have an advantage in social interactions, because this trait may work as a heuristic to infer these type of attributes [8].

The results show only an effect for warmth. When perceiving an individual, we are more likely to rate a person as high in both dimensions, due to halo effect [33]. But it is also possible to assess individuals high in one dimension and low in another [29, 30]. As warmth is more immediate in social interaction [29], this may be explained due to the fact that this attribute is central only for the most immediate dimension. These results corroborate Gonçalves and colleagues findings, which reported that female individuals with larger eyes are judged as warmer than those with medium and small eyes [28]. As well as in our study, no effect of eye size was found for competence, although mean scores were higher for large eye condition, both for male (M = 3.55, SD = 0.31) and female gender (M = 3.58, SD = 0.46).

We confirmed the first research hypothesis, for eye size appears to have an effect on the perception of positive attributes [25, 27], namely warmth. The larger the eye size (larger in height and width), the more individuals seem to perceive positive attributes; hence, this variable may be predictive of the way individuals judge social information, due to their preference for expressive faces and larger facial traits [27].

As described [28], and as far as eye size is concerned, the perception of warmth is higher in the medium and large eye sizes, though no differences between medium and large eye sizes were identified in this study

Grammer and Thornhill [32] found different results, showing that smaller eyes are considered more attractive in females. However, these results may be related to methodological differences or the specific characteristics of the sample used.

Nevertheless, our findings indicate that further studies are necessary to learn more about the centrality of eye size in impression formation.

We also observed a moderate positive correlation between warmth and competence, which confirms other findings [29, 30, 33]. As mentioned, this correlation can be due to halo effect, based on which people usually rate an individual person as high in both dimensions. This means that a person perceived as warmth will also be assessed as competent and vice-versa.

In short, eye size influences social perception and impression formation, as far as warmth is concerned. As a result, individuals are more sensitive to characteristics that fit within this particular variable. It could be interesting that in future research known faces were selected, for which previous impressions were formed, manipulating eye size only.

Eye size may play an important role in psychological constructs and we recommend further research in this area, with other samples and age groups, so as to get a broader knowledge about the apparently increased influence of this facial trait as an individual grows older. It is also important to analyze the effect of eye size on warmth and competence on other variables, in particular persuasion, identity and attribution. Likewise, it would be interesting to compare these results with the perception of negative characteristics.

4.2. Effect of Eye Size on Persuasion

Regarding the second hypothesis, and against our predictions, there was no effect of eye size on the agreement with the selected statement. These results are inconsistent with other findings [13, 14, 15, 16, 17], which show that physical attributes may influence persuasive outcomes.

Thus, among the sample used, physical attributes appear not to work as a heuristic for decision-making process. With the sample used, eye size doesn't seem to play a major role in persuasiveness [18, 19]. These results may be moderated by the participants' age; it is possible that, based on their life experience and wisdom, they analyze people as more than just a good-looking face, understanding that not all that is beautiful is good, at least for dimensions concerning other person's abilities. Similarly, competence was not influenced by eye size, a dimension related to abilities, whereas warmth is related to affection and social demands, with primacy in impression formation [29, 30]. This may mean that, as for this age group, physical attributes are more related to affection than to abilities, thus not influencing persuasive outcomes. Another possible explanation is the fact that no real interaction occurred.

Nevertheless, despite there were no statistically significant differences, it is worth mentioning that the large eye condition shows an overall higher mean (M = 4.03), mainly for males (M = 4.10), possibly because it is a female picture, causing more attention on the opposite gender.

Additionally, using a statement with positive connotations might have influenced the results, regardless of eye size or gender. Thus, we suggest further studies with different statements and the use of the picture along with audio, to measure its influence upon the results. Moreover, it would be important to evaluate the persuasive outcomes in other samples, regarding different age groups.

4.3. Gender Differences

According to the third and fourth hypotheses, we expected to find gender differences for both the perception of warmth/competence and persuasion. However, no gender differences were observed.

As we selected a female picture, it would have been likely to find gender differences for both variables. Indeed, as we pointed out, females showed a higher degree of identification with the female in the picture. As so, this might have

influenced results, but no correlation was found between the degree of identification and warmth/competence or persuasion.

These findings are not consistent with previous research [29, 30], which shows that the perception of warmth and competence implies the use of cues from stereotypes as gender. As so, individuals tend to privilege ingroup members, usually regarded as warmer and more competent.

Once more, these results may be due to the specific characteristics of our sample, namely the participants' age group. We can also suppose that, as eye size is a central trait, people tend not to focus on ingroup characteristics. Also, we must note that we used a picture with an average-looking female face, which is neutral. Thus, in further studies, we might also use other pictures based, for instance, in race. We also suggest the replication of this study using a male picture, so as to analyze in more detail issues concerning gender differences.

5.ACKNOWLEDGEMENTS

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